INTERNATIONAL JOURNAL OF INFORMATIVE & FUTURISTIC RESEARCH (IJIFR)
ISSN: 2347-1697
An Open Access, Peer Reviewed, Globally Indexed and Multidisciplinary International Research Journal
VOLUME 13||ISSUE 1|| SEPTEMBER 2025
Estd Year: 2013 || Website: www.ijifr.org || Email: editors@ijifr.org
Published By: Pioneering Journal Publishers
IJIFR» Impact Factor=8.057, Index Corpenicus Value:6.62

KODUMANALS BEAD – MAKING INDUSTRY: TRACING ITS GLOBAL CONNECTIONS FROM TAMILNADU, INDIA

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ABSTRACT: ***This paper examines the historical significance of Kodumanal, an archaeological site on the banks of the Noyyal River in western Kongunadu, Tamil Nadu, renowned for its bead-making industry. Kodumanal emerged as a major centre of lapidary production and international trade, exporting semi-precious stone beads such as beryl, lapis lazuli, carnelian, and quartz to distant regions spme two thousand years ago. Archaeological excavations reveal its industrial character, with evidence of complex manufacturing processes, specialized artisans, and extensive trade networks. Kodumanal's strategic location near Karur, the Chera capital, and its links to the ports of Muziris and Kaveripoompattinam facilitated maritime exchanges with the Roman Empire, Sri Lanka, and Southeast Asia. The industry not only boosted regional prosperity but also reflected cultural interactions, as seen in Sangam literature and inscriptions that mention Yavana merchants. By combining archaeological, geographical, and literary sources, this study highlights Kodumanal's role as a hub of ancient global trade and its contribution to the socio-economic and cultural development of early Tamil society.***

KEYWORDS: ***Kodumanal, Bead Industry, Kongunadu, Roman Trade, Sangam Age***

PAPER CITATION:
Kavitha, N. & Sandhiya, S. (2025) *: "Kodumanals Bead – Making Industry: Tracing its Global Connections from Tamil Nadu, India", Int. Journal of Informative & Futuristic Research (IJIFR), Vol.(13) (1), September 2025, pp. 96 - 104,*
DOI: ***https://doi.org/10.64672/IJIFR/25.09.13.01.003***

1. INTRODUCTION

Among the major centres of this activity, Kodumanal in western Kongunadu played a vital role. Identified as an archaeological site in 1961 by V.N. Srinivasa Desikan, it has since yielded extensive evidence of habitation, industry, and megalithic burials. Excavations by scholars such as Prof. Y. Subbarayalu and Prof. K. Rajan confirmed its importance as a bead-manufacturing hub during the Sangam period. Raw materials including quartz, amethyst, rock crystal, and beryl were locally available, while rarer stones such as carnelian and cymophane were brought from northern India.Bead-making industry was one of the prominent industries during the Sangam period some two thousand years ago. The rock crystal, amethyst and beryl found at Kodumanal and it furnished quartz, Carnelian and agate to Arikamedu.[i]Prof. K. Rajan pointed out that rare beads were imported from North India during the Sangam period. In addition to that, he also identified that beads took over in

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Published Online through https://ijifr.org/
First Availaible online on : September 11, 2025

Kodumanal excavation such as carnelian, agate and cymophane which were available only in North India.[ii]

"கொடு மணம் பட்ட வினை மாண் அருங்கலம் பந்தர்ப் பயந்த பலர் புகழ் முத்தம்" _ ***Pathittrupathu***

Sangam literature, including Pathitrupathu, refers to Kodumanal (then Kodumanam) as renowned for its bead stone industries. The widespread use of ornaments among all social groups highlights both the economic significance and cultural symbolism of bead-making. This study seeks to examine Kodumanal's role in production, trade, and cultural interaction, situating it within broader networks that connected Tamilakam with the Roman world and beyond. The ancient people used *Navaratinams* (nine types of gems) in ornaments making. They were pearl, emerald, sapphire, garnet, coral, ruby, diamond, cymophane and yellow sapphire. The kings and queens predominantly used expensive ornaments made with beads, whereas the common people used affordable and secondary ornaments. During the Sangam age, wearing ornaments is considered a kind of ritual and tradition. It shows their economy and earned respect in the society through ornaments. Kongunadu is acclaimed for its best literary heritage, deeply influenced by Sangam literature and enhanced Tamil culture. The study demonstrates that craft productions at Kodumanal are carried out at multiple levels.

2. AREA OF STUDY

The Western Kongu region in Tamil Nadu, which encompasses the districts of Tiruppur, Erode, Nilgiris, Coimbatore, Salem, Namakkal and Dharmapuri in ancient times, specifically concentrated on Kodumanal, holding significant historical importance. The Sangam literature mentioned the Kodumanal region as the most prosperous city. This research paper aims to examine the region's bead-making progress and the trade networks worldwide. Beyond this bead-making industry, the excavations have unearthed potsherds, ornaments and other wealthy artefacts which revealed the socio-cultural development of this region.

3. OBJECTIVES

1. To introduce the historical, archaeological, geographical, and cultural background of the Kodumanal region during ancient times.
2. To trace the historical development of bead-making and identify the key players in the industry.
3. To examine commercial trade contacts with distant lands, from the Roman Empire to Southeast Asia, and their long-term impact on local society.
4. To evaluate raw materials, lapidary centres, and trade routes through which finished beads circulated.
5. To analyse the challenges faced by artisans and merchants in producing and exchanging goods.

4. SCOPE OF STUDY

The study focuses on Kodumanal's bead-making industry and its role in ancient global trade. It includes an in-depth analysis of beads made from quartz, carnelian, beryl, and lapis lazuli, while also exploring the socio-cultural and economic dimensions revealed through excavations. The scope extends to the region's connections with the Roman Empire, Sri Lanka, and Southeast Asia, situating Kodumanal within the wider networks.

5. METHODOLOGY

This study adopts a descriptive and analytical approach. It draws on primary sources such as archaeological evidence, government reports, and excavation records from Kodumanal, alongside literary sources from Sangam texts and inscriptions. Secondary sources—including books, articles, and research papers—are reviewed to contextualize findings and support interpretation. Excavation

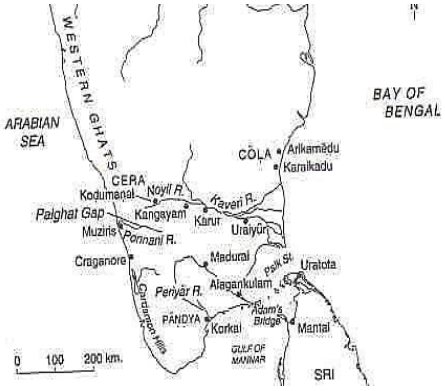
reports by scholars such as K. Rajan, Y. Subbarayalu, and N. Athiyaman form the core of the archaeological evidence base. By combining literary, archaeological, and geographical data, the methodology enables a comprehensive understanding of Kodumanal's bead-making industry and its global trade links.

6. REVIEW OF LITERATURE

Scholarly works provide valuable insights into Kodumanal's history and trade networks:

- ***Mayilai SeeniVengatasamy*, *KonguNaatuVaralaru*** – outlines the history of Kongu Nadu and its Yavana trade contacts.
- **K. S. Vaidyanathan, The Ancient Geography of the Kongu Country** – details the geography, rivers, hills, flora, fauna, and trade routes of Kongu Nadu.
- **Raghavan, *Tamil Nattu Anikalangal*** – compares ornaments excavated in the Indus Valley with those in Kongu Nadu.
- **K. Rajan, The Early Writing System** – discusses archaeological evidence and gemstone/conch industries in the region.
- **Francis Hamilton Buchanan, A Journey from Madras**… – documents the physical geography of southern India and trade routes.
- **V. Kanakasabai, The Tamils 1800 Years Ago** – describes Sangam-period culture, lifestyle, and foreign trade.
- **K. Rajan & N. Athiyaman**, "Traditional Gemstone Cutting Technology in Kongu Region" – examines techniques of gemstone cutting and bead distribution.
- **K. Ashoka Vardhan Shetty, Excavation Report of Perur** – highlights excavations at Kodumanal, Arikamedu, and Perur, including Roman coins and ornaments.
- Together, these works establish a strong foundation for analysingKodumanal's bead industry, confirming its role as both a cultural hub and a node in global trade.

7. GEOGRAPHICAL FACTORS



Though Kongu Nadu formed part of ancient Tamilakam, it retained a distinct geographical identity. During the Sangam age, Tamil land was divided into
Chera Nadu, Chola Nadu, Pandya Nadu, Tondai Nadu,
Tulu Nadu and Kongu Nadu. The Kongu region, later reduced in extent under Chera, Chola and Pandya rule,
was renowned for its fertile agriculture, cattle wealth, honey, flowers, intoxicating drinks, and dairy products. Its people, the Kongars, lived in a land farmed by the Western and Eastern Ghats, with hills, forests and river basins that sustained a favourable climate.[iii]The Kaveri, with its tributaries such as the Kabini, Bhavani, Amaravathi and Noyyal, enriched the landscape. Notable hill ranges—the Kolli, Shervarayan, Palani, Pachaimalai, Pavalamalai and Anaimalai—were rich in minerals including granite, basalt, quartz and semi-precious stones.

Kodumanal, located in Perundurai Taluk of Erode district on the northern bank of the Noyyalriver, was a key industrial and habitation site between the 3rd century BCE and 4th century CE. Its semi-arid environment was close to rich gemstone sources: Padiyur yielded beryl, Chennimalai sapphire, and Vengamedu and Arasampalayam quartz, much of which was exported to Rome, Greece and Arabia. Karur and Kodumanal were also noted for iron and steel production, sent via the ports of Muziris and Kaveripoompattinam.[iv] Kodumanal is not only an industrial site but also an Iron Age habitation cum burial site that has occupied between the 3rd century B.C.E and the 4th

century C.E. Kodumanal is preferably located close to the accumulation of raw material sources that have contributed to its functioning as a multi– industrial site and artifacts have been carbon dated, which placed them between 480BCE and few to 1st century BCE**.** The hillock of Padiyur and Arasampalayam can be seen to the right side; however, these sites are not focused particularly during the Sangam age. Pliny, the Roman author, mentioned Padiyur as *Paedoros*, an extensive dyke abounding with masses of quartz, with large crystals, beryl and garnets.[v]These sites are under the protection of the Geological Survey of India. It is identified that iron was found in this areaaffirming its role as a major industrial and trade centre of ancient Kongu Nadu.[vi]

8. BEAD MAKING INDUSTRY

The bead is a kind of decorative object, formed by various stones that are available naturally. In *Pathupattu,* Kabilar stated that,

"***Ilangu Kadhirthirumani Peru um Agankan Veipin Naadu"***

Beads were a key element of adornment in early Tamilakam, fashioned from a wide variety of stones and shells. Sangam texts frequently describe ornaments, with Pathupattu noting the natural availability of sapphire in Kongu Nadu. Literary sources list gemstones such as *Palinku*[vii](marble), *Manikkam*[viii] (ruby), *Pavalam*[ix] (coral), *Karumainiramani*[x] (black bead), M*ani Patikkappetra Motiram*[xi](bead embedded ring), and *Muthu*[xii](pearl). During ancient times, the forehead was referred to as "M*udhal",* and the people who wore ornaments on their forehead were called "N*udhalani".* From common people to affluent people, including kings and queens habitually wearing ornaments on their forehead, arms, hands, wrists and legs are identified in different terms in recent research as *toti, valai, katakam* and *Kaivanti.* In 1961, the industrial site at Kodumanal was unearthed by S.Raju and the excavations carried out at five seasons by the state department of Archaeology shed light on the vestiges of cultural artifact revealing the presence of iron, steel and gem industries at Kodumanal around 300 B.C

8.1 CARNELIAN BEADS

Excavations reveal Kodumanal's burial grounds, spread across 30 hectares with more than 300 megalithic tombs.[xiii] The unique big cist circle of about 15meters in diameter, urn burials and menhirs are also found. The composite burial of a couple and child in trench ZJ26 illustrates their high status, with beads as markers of prestige and afterlife belief.[xiv]The ancient Tamils believed that the grave goods would equip the individual for the afterlife. Through excavations, we came to know their significant societal status. The names '*KannanAthan', 'VaruniyaAgazh', 'KoolanthaiVambanAgazh'* inscribed on the potsherds.[xv]

(1)

(2)

Figure 1 & 2: Variety of carnelian beads ariety of carnelian beads

The graveyards in this region have yielded a variety of carnelian beads around 80 to 2220 found in a single burial. The Menhir, erected mostly in single stone which is tall, large and upright megalithic burial monument were found in Kodumanal excavation.[xvi]

8.2 QUARTZ BEADS

Quartz beads are another variety of gemstones, found in various excavation sites in Tamil Nadu. However, those found abundant in Kodumanal include **spherical, biconical and collared beads**. The hillocks of Sivanmalai and Perumalmalai with sapphire stones lie about 15 km south and

(3)

(4)

(5)

Figure 3, 4, 5: Spherical, Biconical and Collared quartz beads in Kodumanal

Southeast of Kodumanal. The other sites such as Vengamedu ("venga" means quartz and "medu" means mound) and Arasampalayam which bear many quartz beads respectively, lie 5 km north and south of Kodumanal. The soapstone beads were generally circular, elongated and barrel-shaped found in excavations at Varayur, Mangudi, Perur, Keezhadi and Kodumanal.[xvii]

8.3 CONCH & SHELL

The Kodumanal region is also famous for conch and shell ornaments during excavations. The pieces of shell bangles and conch jewels were collected in 1990 excavations. Excavations between 1990 and 2013 uncovered shell were bangles and conch jewels, linking Kodumanal to Gujarat and Sri Lanka where similar designs were found. Compared to other pieces of jewellery, the most common ornaments used by all women were bangles, in different designs with intricate carvings known as '*varivalai'*. The craftsmen who used shells in making ornaments were called 'K*otupolkataiyinar'* in the literary work *"Madhurai kanchi"*.

Figure 6: Conch and shell

The people from low classes wore least priced ornaments such as white beads, sapphires and shell bangles.[xviii] Sangam texts such as Maduraikanchi refer to shell craftsmen (Kotu polkataiyinar). While elites wore gems and carnelian, women of lower social groups often used shell ornaments, white beads, or sapphires. Tolkappiyam names various marine resources—*Sangu* (conch), *Chippi* (shell), *Nandu* (crab), *Kilincal* (oyster), *Nollai* (snail).

The Kaveri is a major riveine tract within easy reach of Kodumanal and provides rock crystal, amethyst and its derivatives, and citrine, the same as in Arikamedu finds. The agate chunks have been explored at the walled site of Kothalinga, dated back to the 5th century B.C. in Karimnagar district, Andhra Pradesh.[xix] The same source has been found at Arikamedu and Kodumanal. The other artefacts such as the rings and, pendants are one of the most important forms of local production in this region. The Romans were major buyers of the stone beads. Pliny the Elder, in his Natural History, discussed the gemstones, often mentioning their South Indian origins.

"*Beryls are produced in India and rarely found elsewhere."*-Eichholz1962:225

However, in this region we excavated artefacts at different phases, and the trade contacts have increased across the world, but when we come into the concept of production and its parameters, it is not much clear. The present study by the foreigners addresses the context of production and its

variables or parameters. Van der Leeuw had defined the five basic types of craft specialisation as house hold production, household industry, workshop industry,
village industry and factory industry.[xx] The diverse technology is another important feature of the craft production at Kodumanal.

The two different techniques followed in the stone bead manufacture process are: one is '**grinding**' (grinding, drilling and polishing) and the second being '**pecking**' methods (pecking, polishing and drilling). These techniques were employed contemporaneously at Arikamedu.[xxi] The portion of materials examined in Kodumanal, and most of the beads were made with the pecking method. The impressions of drill holes found in the beads under the Scanning Electron Microscope (SEM) from Kodumanal, reveal that drilling techniques were also used.[xxii]

Figure 7: Craft specialisation as house hold production at Kodumanal

The metal production at Kodumanal seems to be fairly high. The iron, copper and bronze were the important metals used in the stone bead manufacture. The evidence of iron working at Kodumanal is concentrated on the southern side of the mound. Peter Francis, during excavation at Arikamedu, found spindle whorls in the shape of areca nut, the same as 80% of spindle whorls at Kodumanal with clear distribution.

N. Athiyaman and K. Rajan mentioned that gemstone cutting is a traditional occupation in the Kongu region, but the use of electricity is a recent innovation. The blocks of moonstone were purchased in different sizes and used as a raw material. The machine allows the series of five wheels to turn into a shape and polish a single bead. After polishing, the bead is washed in warm water detergent. To complete a single bead, it takes 25-40 minutes of labour work. These are later exported to Rajasthan; not only the moonstone but also other semi-precious stones such as amethyst, aquamarine and so on that are very highly priced.[xxiii] They manufactured even minute beads measuring five mm in length and one mm in thickness, highlighting their sophisticated technology and the skilled labours.

9. THE GLOBAL CONNECTIONS

Trade and cultural exchange between Kodumanal and distant lands was well established from the early centuries BCE. Merchants used both overland and maritime routes, linking Tamilakam to the Mediterranean, Sri Lanka, and Southeast Asia. Ancient highways (peruvalis or neduvalis) connected Kongu Nadu with coastal ports. The Palghat Gap in the Western Ghats was the most strategic passage, offering safe and direct access between the Malabar and Coromandel coasts. Other important passes included Toppur, Aryankavu, Bodinayakanur, Kamban, Aramboli, and Shenkottai. A 9th–10th century CE inscription at Aragalur in Salem mentions such highways. Russet-coated ware found at Kodumanal, Karur, Arikamedu, and sites in Andhra Pradesh and Karnataka further confirms these inland links.

The distant land connections and the culture exchanges happened from the earliest times; the merchants from overseas found the trade routes through land and sea and laid the foundation for cross-cultural exchange. Trade, has influence on political, social and cultural aspects in every country. Apart from the literary evidence, the archaeological sources have complemented the deep information regarding modes of transport and maritime travels. Foreign travelers who visited India at different times mentioned in their accounts that they had gone through obstacles on the way and always held maps in their travels. The ancient roads were completely different from modern times because of the development of technology, the increase in population, and the commercial activities between various countries through different routes at the same time enhanced the country's economy. The passes, mountain ranges and gaps in the Ghats interconnected the subcontinent as a chain since ancient times;

the passage between the Nilgiris and Anaimalai hills in the Western Ghats was the foremost communication line from the Malabar Coast and Coromandel Coast. The gaps, such as the Palghat pass, the Toppur pass, the Aryankavu pass, the Bodinayakanur pass, the Kamban pass, the Aramboli pass and the Shenkottai pass, but the Palghat gap was a very safe and short way with easy access towards the cities of Kaveri Valley. The active trade was carried on between Kongunadu and Rome for the first three centuries of the Christian era. The archaeological excavations carried out at Kongunadu, found abundant roman coins at the sites of Karur, Kodumanal, Salem and Coimbatore Plateau. The roads are long and narrow, named as highways (peruvalis or neduvalis) indicated in the inscriptions (Kandaswami: 2000:44, Selvaraj 1989). Through the land and sea routes, the commodities reached the local market or towns.[xxiv] The roads are extended with good facilities by the traders and foreigners; they removed the obstacles which the goods were unable to outstretch the destination.

The two principal routes of the Palghat gap: the first running from Salem to the east coast through the lower valley of the river Pennaiyaru and the other follows the river Kaveri through Thanjavurto meet the ports on the east coast. The Tamil inscription datable to theninth - tenth centuries CE from a Shiva Temple at Aragalur in Salem district which refers to a highway (peruvali) leading to Kanchipuram.[xxv]The presence of russet-coated ware at sites such as Kodumanal, Karur, Porunthal, Tirukkampuliyur, Alagarai, Uraiyur, Kanchipuram and Arikamedu in the Tamil region, and also in the sites of Andhra Pradesh and Karnataka indicate the connection of Coimbatore-Salem and coastal regions of Tamil Nadu with the Andhra region through the north-eastern route.[xxvi]The chank-cutting tools and the shell industries found at Arikamedu, Kodumanal, Tirukkampuliyur, Alagarai, Uraiyur, Korkai, Alagarai and Kraikaddu show they used maritime routes connecting the Persian Gulf and the Red Sea.[xxvii]Ports such as Muziris (Pattanam), Arikamedu (Poduke), and Kaveripoompattinam served as gateways for Roman and West Asian trade. Shell-cutting tools and industries at Arikamedu, Kodumanal, and Korkai point to strong maritime activity. The Periplus of the Erythraean Sea and Ptolemy's Geography document mentioned the brisk exchanges of gemstones, pearls, and ornaments from the Tamil coast.[xxviii]By the 3rd century CE, Tamil merchants extended trade to Sri Lanka and Southeast Asia. While Kodumanal had access to local resources like sapphire, beryl, and quartz, materials like carnelian, agate, and lapis lazuli were sourced from places like Gujarat, Sri Lanka, and Afghanistan. Carnelian and agate, commonly found in Kodumanal beads, were likely imported from Srilanka, indicating a connection in the supply chain. In Srilanka potentially at sites like Tissamaharama and Anuradhapura beads excavated at Kodumanal revealed some of which likely originated from Srilanka. Beads and ornaments travelled along the same maritime routes, and cultural exchanges deepened through settlement and craft diffusion.[xxix]Excavations at Kodumanal, Karur, Salem, and the Coimbatore Plateau yielded abundant Roman coins, attesting to intensive trade during the first three centuries CE. Pliny the Elder's Natural History notes Indian beryls, prized in Rome. Exports included carnelian, agate, quartz, and beryl, while imports likely included gold and luxury goods.

The discovery of coins from Karur helped us to mark the route followed by the traders and their arrivals at Pattanam. The fall of Hellenistic states and the Roman civil wars are seen as the reasons for the absence of Greek coins in south India after 100 BCE.[xxx] The Periplus of Erythraean Sea and Ptolemy's Geography give us the detailed information of brisk trading activities along the Indian subcontinent. However, the trade between two or more countries are not a rapid development; it is a gentle process in which the trade routes connected the branches of countries on all sides. The traders have struggled while transporting goods through natural calamities and other ways to reach the final destination. The ancient Tamilakam and Romans had significant trade contact; that river beds and land routes served as a useful channel for moving goods as far as the among interiors inlands.

10. CONCLUSION:

The history of Kongu Nadu is distinguished by its active role in global exchange, with Kodumanal standing out as a key industrial and cultural Centre. Excavations have revealed thousands of artefacts, among which the stone beads represent a unique craft tradition that connected Tamilakam with the wider world. Beads of carnelian, agate, and quartz not only enriched the economy but also symbolized status and identity in Tamil society. Foreign demand, especially from the Mediterranean, reinforced the region's importance in early maritime networks. This study underscores how Kodumanal's artisans, resources, and strategic location fostered cross-cultural interactions and long-distance trade. By situating Kodumanal within the broader framework of ancient globalization, the paper contributes to understanding the cultural heritage of Tamil Nadu and its enduring legacy in world history.

11. REFERENCES:

[1] [i]Francis, Peter Jr, *'The Stone Bead Industry of Southern India',* BEADS: Journal of the Society of Bead Researchers, Vol12, 2000, p.48
[2] [ii]K. Rajan, *TholliyalNokkil Sanga Kaalam*, International Institute of Tamil Studies, 2011, p.119
[3] [iii]K.S.Vaidyanathan, *The Ancient Geography of the Kongu Country*, Prabha Printing House, Bangalore, p.8
[4] [iv]G. Malathi, *Archaeological Important towns of Kongu Nadu*, JETIR, Vol. VI, 2019, p. 122.
[5] [v]Jas. Burgess, *The Indian Antiquary, A Journal of Oriental Research*, Vol. V, 1876, p.237
[6] [vi] Buchanan Francis, *Ajourney from Madras through the Countries of Mysore, Canara and Malaba*r, Vol. 3, Asian Educational Services, Madras, 1807.
[7] *[vii]Purananooru*, 137:11, *ThiruvalluvaMalai*.250, *Agananooru*.56:2, 167:1,368:10
[8] *[viii]Purananooru*.172:7, *Mullai*.63, *Mad*uraikanji.438, *Kurinji*.13, *Pathupattu*.187, T*hiruvalluvaMalai.*516, *Kalithogai*.135:18, *Pari.*21:57
[9] [ix]Kurunthogai.198:4, Agananooru.5:25, 16:3, 66:14, Kali 79:8, 81:1, 130:59
[10] [x]Purananooru. 340:1
[11] [xi]Agananooru. 38, 613
[12] [xii]*Nattrinai*. 280:2, *Par*i. 1:16, 9:10
[13] [xiii]K. Ashoka Vardhan Shetty, *Excavations at Perur*, Department of Archaeology, Government of Tamilnadu, Chennai, 2003, p.6
[14] [xiv]Y. Subharayalu, *A report on Kodumanal Excavation* 1988, p.57
[15] [xv]K. Rajan, *Kodumanalakalayvu*, pp.32-34
[16] [xvi]K. Rajan, *Archaeology of Tamilnadu*, pp.67-68
[17] [xvii]K. Rajan, *Kodumanal Excavation – A report*, Gouvaram, B.K. Gururajarao Felicitation volume, State Department of Archaeology, Government of Tamilnadu,.1996
[18] [xviii]V. Kanakasabai, *The Tamils 1800 years ago*, Kazhagan Publishers, Chennai, 2018., p.86
[19] [xix]A.J.Arkell, *Cambay and the Bead trade*, 1936, Antiquity 10(39)
[20] [xx]S. E. van Der Leeuw, *Pottery Manufacture: some complications for the study of trade,* Los Angeles: UCLA, Institute of Archaeology, 1984, pp.55-70
[21] [xxi]Peter Francis, *Beads and small finds from the 1989-92 Excavations, In the ancient port of Arikamedu: New Excavations and Researches*, (V. Begley, N. Karashima, K. V. Raman, S. E. Sidebotham and E. L. Will eds.) Paris: Ecole Francaise d'Extreme Orient, pp.447.
[22] [xxii]H. M. L. Miller, Associations and Ideologies in the Locations of Urban Craft Production at Harappa, Pakistan, *In Rethinking Production in Archaeology*, (R. Flad and Z. X. Hruby eds.) Arlington, VA: Archaeological Papers of the American Anthropological Associations, 2007, pp.37-51
[23] [xxiii]K. Rajan and N. Athiyaman, *Traditional Gemstone Cutting Technology in Kongu Region in Tamil Nadu,* Indian Journal of History of Science, 2004, p.385
[24] [xxiv]Vikas K. Verma, *Trade Routes of Early Tamilakam – A Study of the Archaeological Sources*, Journal of History, Art and Archaeology, Vol. 2, 2022, p.85
[25] [xxv]Deloche, Jean. *Transport and Communications in India (Prior to Steam Locomotion)*, vols. 1 &2, (LandTransport& Water Transport), Delhi: Oxford University Press, 1993, p.79
[26] [xxvi]Vikas K. Verma, op.cit., p.86
[27] [xxvii]Vikas. K. Verma,*Coromandel Trade in Early South India: An Archaeological Perspective*, Delhi:Agam Kala Prakashan, 2021, p.128
[28] [xxviii]Casson, Lionel,*The Periplus Maris Erythraei: Text with Introduction, Translation, and Commentary*, Princeton: Princeton University Press, 1989
[29] [xxix]Mitchiner, Michael, *The Numismatic Record of India of Early Maritime Trade,* Journal of Numismatic Society of Indi*a,* vol.VII, 1995, p.60

[30] [xxx]W. Duan Roller, *A Note on the Greek Coins from Tamilnadu*, Numismatic Digest, 1997, p.37.